

A CASE OF GLIOMA OF THE RIGHT CRUS CEREBRI.

BY WILLIAM PEPPER, M.D.,

AND

FREDERICK A. PACKARD, M.D.,

OF PHILADELPHIA.

THE following case was seen in connection with Dr. F. A. Rankin, of Newport, R. I., and presents several points of decided interest which make it worthy of a place in the records of cerebral tumors. The existence of a marked distal irritative condition, suggesting a reflex origin of the symptoms presented, embarrassed what might, in its absence, have been a matter of approximately certain diagnosis.

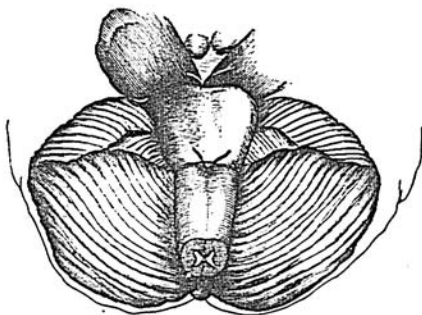
Hamilton R., white, aged nearly four years. The mother, thirteen years older than the father, is in good health. The father was married at the age of eighteen, and is a confirmed asthmatic. The first child born to these parents died after an illness of a few hours from what was said to be pneumonia. The patient was always a vigorous-looking child, but was thought by some never to have appeared "quite natural" (probably only an idea).

Without any recognizable predisposing or exciting cause, on May 15, 1889, awkwardness in using his left hand and foot was for the first time noticed, it being also remarked that he eat less neatly than usual. From this condition the left side steadily and rapidly became the seat of nearly complete paralysis. The hemiplegia was not complete, as the left leg and foot could be moved, although only to a very slight extent. The left upper extremity was completely paralyzed, the elbow spasmodically flexed, the fingers firmly closed over the thumb, the latter being firmly drawn into the palm. There were no contractures of the lower extremity. Pain was caused by an effort to overcome the flexion of the elbow and fingers. The contractures of the left arm were said to become less firm during sleep. The left side of the face was completely paralyzed, the tongue being protruded to the left. Dr. Rankin, who was in attendance upon the case, had at one time observed occasional ptosis of the left upper eyelid, with strabismus. At the time of examination, however, both eyes could be easily opened or closed at will, there was no squint and the state of the pupils was normal; vision was apparently unimpaired as roughly tested by the ability to count fingers. There was no diplopia; under the circumstances existing at the time of examination no ophthalmoscopic examination of the fundus or accurate estimation of the fields of vision could be made. Hearing was apparently unimpaired. There was no complaint or evidence of headache or of pain in any other part. Accurate investigation into the condition of sensibility to touch, temperature, or pain was impossible, but there was no gross change noticeable in any of these particulars. There was no marked loss of flesh, and when seen two days before his death the child was apparently vigorous and well nourished.

The patient slept well. During sleep the action of automatic swallowing was evidently impaired. He had frequent choking spells, but

although there was constant dribbling of saliva from the mouth there was no regurgitation through the nostrils. After the choking spells he had labored and irregular breathing. He took a good deal of liquid food, but the appetite was impaired. The bowels were regular. The frequency of micturition gradually became increasingly diminished, until two weeks before death he urinated but once in twenty-four hours, even then voiding but a small quantity.

His condition was rapidly growing worse, with decreasing willingness and ability to take nourishment; more frequent choking spells from accumulation of mucus and saliva; and progressive loss of power, so that he seemed very helpless, although the actual palsy was limited to the left side. A high degree of phimosis existed, and, although there was strong reason to diagnose serious cerebral lesion, it was deemed better to have circumcision performed in the hope that the hemiplegia might, in part at least, be of reflex origin from that source. The operation was accordingly performed by Dr. Rankin, on the following day, under the influence of ether, of which but a very small quantity was employed. The etherization was accompanied by no disagreeable or unusual symptoms. The prepuce was found closely united to the glans by adhesions, which were separated in the usual manner. He bore the operation well and recovered from the effects of the anæsthetic easily and naturally. During the remainder of the day of operation he seemed as well as he had been for some time, took food, asked for his toys, and made no complaint. During the night following the operation he passed urine.



About fourteen hours after the operation the child became unconscious, the left pupil tightly contracted, the right enormously dilated. The spasmodic condition of the left arm disappeared and was replaced by flaccidity of the whole left side; very little movement was, of course, made with the right side. There was some transient contraction of the muscles of the jaw. Respiration was very shallow and irregular, later becoming tidal in character. The rectal temperature rose to 103° F. Several convulsions accompanied by opisthotonos preceded death, the latter occurring twenty-four hours after operation. On post-mortem examination there

was found a hazelnut-sized tumor projecting from the outer side and under surface of the right crus cerebri, its bulk lying close to the point of entrance of the crus into the body of the pons Varolii. Microscopic examination of sections of the growth, by Dr. Allen J. Smith, showed it to be a glioma.

The case presents numerous points of interest, particularly from the fact that the growth was confined to a portion only of the tract by which all motor and sensory fibres travel between the cerebral cortex and the nerve trunks.

The diagnosis of the cause of hemiplegia lay between cerebral injury, thrombosis, embolism or tumor, and reflex irritation from the glans penis. Cerebral injury was excluded by the history. The time of progressive increase of symptoms was too long for thrombosis and not sudden enough for embolism to be looked upon as the causative factor. Moreover, the symptoms continuously progressed, as would not have been the case were the hemiplegia of an embolic origin. The diagnosis then lay between hemiplegia produced by cerebral tumor and that due to reflex causes. Neither of these factors could be positively excluded, yet there was evidence sufficiently strong to warrant the possibility of either condition existing. The history of gradual onset and steadily progressive course of the paralytic symptoms pointed toward the existence of brain tumors, but would not exclude the, at least, partial reflex element caused by the existing source of irritation. The oculo-motor symptoms resembled in their fugaciousness those due to reflex irritation rather than brain tumor. This instability of some of the symptoms would, on the other hand, not exclude brain tumor, as temporary intensification of existing or appearance of additional symptoms is by no means uncommon in those cerebral tumors which are prone to vascular distention or hemorrhage. Had ophthalmoscopic examination of the eye-grounds been available, more positive evidence might have been obtained.

Taking the view of tumor as probable, we see that no localizing symptoms were presented other than those which indicated that the lesion was situated upon the right side of the brain, either as an extensive tumor in the Rolandic region, a central growth involving the internal capsule or its surrounding nuclei, or of the right crus so situated as to leave undisturbed the upper or sensory layer.

Viewed by the light shed upon the case by the autopsy the symptoms are seen to correspond remarkably closely to those necessarily produced by a lesion such as was found, except for the fact that it is difficult to explain the escape of the fourth cranial nerve, whose trunk winds around the crus at very nearly the position occupied by the tumor. The facial nerve trunk was not affected, the existing palsy being upon the side opposite to the lesion, and due, therefore, to implication of the facial fibres between their origin in the cerebral cortex and their decussation

in the pons Varolii. Had the entire width of the crus been involved, or had the tumor been of greater size, there would doubtless have been presented permanent symptoms referable to the oculo-motor apparatus from pressure upon one or both of the third nerve trunks at the point of emergence from the angle formed by the approach of the crura to enter the pons. The transient occurrence of these symptoms indicates that there must have occurred some temporary (probably vascular) enlargement of the growth. The explanation of the absence of *total* paralysis in the lower extremity may indicate that the fibres to that part run nearer to the median border of the crus than do those to the arm. Hemianopsia was presumably not present, because of the tumor being situated too far behind the point of superficial origin of the optic tract to make pressure directly upon it, and because the tumor was too small to produce any very marked "distant effects." The difficulty experienced in swallowing could conceivably be due to indirect involvement of the trunk of the fifth cranial nerve, the glosso-pharyngeal and pneumogastric nerves being so far away as to render their involvement improbable. The dysphagia would then have a sensory and not a motor origin.

Had it been possible to exclude absolutely the reflex origin of the hemiplegia, it would have been difficult, if not impossible, to exclude a lesion of the internal capsule or corpus striatum, in the absence of crossed third or fourth nerve palsy or other symptoms implying involvement of the nerve trunks of the base of the brain.

The points to be extracted from the present case may be of some value in aiding the elucidation of the subjects of cerebral localization and of focal diagnosis of brain tumors.

To sum up the salient features:

From a tumor of the right crus cerebri close to its entrance into the pons Varolii, involving chiefly its outer border and inferior surface, the symptoms produced were left sided facial and corporeal hemiplegia with most marked involvement of the upper extremity; protrusion of the tongue to the left; marked contractures in the upper, with none in the lower, extremity; unaltered sensibility; transient involvement of the extrinsic ocular muscles; absence of hemianopsia and of paralysis of the masticatory muscles.

Absolute certainty in diagnosis as to the character of the tumor would have been impossible. The family history and the good state of general health would have almost excluded the suspicion of its being tubercular in character, as would also, to some extent, the clear evidence of the lesion being solitary. Carcinoma would have been excluded by the patient's age, while a specific origin was negatived by the health of the parents and the child's appearance of good general health. By exclusion, then, glioma would be the probable diagnosis.

No operative interference for the removal of the growth could, of course, have been of benefit, nor would the widespread symptoms point to a cortical lesion, unless to one of such extensive area as to have rendered its removal extremely hazardous, if not impossible. Bearing in mind the known danger of the use of anæsthetics in cases of brain-tumor, yet appreciating the importance of correcting an existent peripheral source of irritation, ether was given, but in very small quantity. The good recovery from the effects of both the anæsthesia and operation, and the interval between these and the fatal ending, would indicate that the operative procedures could not have caused death except, possibly indirectly, by increasing in some way the vascularity and, therefore, size of the growth.

INJURY OF CERVICAL SPINE, WITH LUXATION; REDUCTION; CURE.

BY ALEXANDER W. ACHESON, M.D.,
OF DENISON, TEXAS.

F. J. W., aged fifty-five years, a railroad conductor in the employ of the Missouri, Kansas & Texas Railway, on the 10th of July, 1889, at the town of St. Jo, Texas, was assisting in the side-tracking of some flat cars, the brakeman being at the switch-target, while he stood on the siding awaiting the approach of the cars. As they came toward him he grasped the brake to mount a car, when the staff broke, and he was precipitated, back downward, in front of the train, his head falling between two ties, while the brake-beam caught his body, pushing it toward his head and turned him a complete somersault, leaving him lying on his face. He was found beneath the second car, three trucks having passed over him. When dragged from beneath the train his upper extremities were paralyzed and he insisted that they were cut off, and he would not believe to the contrary until his gloves were removed and his hands held up for his inspection. This occurred at five P. M. Nothing was done for him that day.

On July 11th, at noon, nineteen hours after the accident, I received him at the depot at Denison, and had him transferred to his home, where an examination revealed a slight bruise on the right leg, another unimportant wound on the left shoulder, and a bruise the shape of the letter "J," beginning on the edge of the forehead over the right eye, running backward and around the upper edge of the occiput, and terminating about where it joins the left parietal bone. This bruise was about an inch wide and plainly visible, as the man was bald.